

WHAT IS CLAIMED:

1           1. A method for use in a network element of a packet-based network, the method  
2 comprising the steps of:  
3           storing failure information associated with the packet-based network and usage  
4 information for a backup resource;  
5           upon receipt of a new demand, determining if the backup resource is shareable as a  
6 function of the failure information and the usage information.

1           2. The method of claim 1 wherein the failure information is associated with links  
2 of the packet-based network, the backup resource is a backup path, the usage information  
3 is related to a bandwidth associated with the backup path, and the new demand has an  
4 associated bandwidth,  $d$ .

1           3. The method of claim 2 wherein the determining step includes the steps of:  
2           determining, from the failure information, if a simultaneous failure can occur on  
3 the backup path and a primary path; and  
4           if no simultaneous failure can occur, updating usage information for the backup  
5 path as a function of the bandwidth  $d$  associated with the new demand.

1           4. The method of claim 3 wherein the updating step includes the step of  
2 determining, from the updated usage information, if the backup path can support the new  
3 demand such that if the new demand cannot be supported the new demand is rejected.

1           5. A network element for use in a packet-based network, the network element  
2 comprising:  
3           a memory for storing failure information associated with the packet-based network  
4 and usage information for a backup resource; and  
5           a processor, responsive to receipt of a new demand, for determining if the backup  
6 resource is shareable as a function of the failure information and the usage information.

1           6. The network element of claim 5 wherein the failure information is associated

2 with links of the packet-based network, the backup resource is a backup path, the usage  
3 information is related to a bandwidth associated with the backup path, and the new  
4 demand has an associated bandwidth,  $d$ .

1 7. The network element of claim 6 wherein the processor determines if the backup  
2 resource is shareable by determining, from the failure information, if a simultaneous failure  
3 can occur on the backup path and a primary path, and, if no simultaneous failure can  
4 occur, updating the usage information for the backup path as a function of the bandwidth  
5  $d$  associated with the new demand.

1 8. The network element of claim 7 wherein as part of the updating of the usage  
2 information, the processor determines, from the updated usage information, if the backup  
3 path can support the new demand such that if the new demand cannot be supported the  
4 processor causes the new demand to be rejected.

1 9. A network element for use in a packet-based network, the network element  
2 comprising:

3 a memory for storing failure information associated with a number of links of the  
4 packet-based network;

5 a communications interface for coupling to a link that is a part of a backup path;  
6 and

7 a processor, responsive to receipt of a new demand, for determining if the backup  
8 path is shareable with the new demand as a function of the failure information and usage  
9 information associated with the backup path.

1 10. The network element of claim 9 wherein the processor rejects the new demand  
2 if the backup path and a primary path associated with the new demand are determined to  
3 be capable of failing simultaneously from the failure information.

1 11. The network element of claim 9 wherein the processor rejects the new demand  
2 if the backup path cannot support the new demand based upon the usage information.